

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of producing sheets of glass having two faces (F_1 , F_2) with at least one of said faces (F_1) presenting a high surface quality in a fusion down draw process, the method comprising:

a) delivering a stream of glass (1a) having a viscosity in the range of about 10 Pa.s to about 1000 Pa.s (100 poises to 10,000 poises), said stream of glass (1a) falling downward and having a first and second face (s_1 , s_2), each face is free from making contact with any surface and thus possibly being destabilized mechanically;

b) treating said delivered stream of glass (1a) prior to destabilization by putting a first face (s_2) into contact with a surface of a treatment device or mechanism (4a) suitable, temporarily, to support the weight of said glass and for accompanying the falling movement of said glass while increasing glass viscosity and maintaining at least a central strip of said second face (s_1) free from any contact with any surface;

c) releasing said treated stream of glass (1a') from said treatment device or mechanism (4a), said treated stream of glass falling (1a') downward from said treatment device or mechanism with at least said second face (s_1) being free from making contact with any surface;

d) using a device or mechanism (7, 8) for controlling [glass travel] the speed, width and thickness of the treated stream of glass (1a) to act on the treated stream (1a') at a suitable distance downstream of the treatment device or mechanism [to produce a sheet of glass]; and

[d]e) cooling said treated stream of glass to produce a sheet of glass.

2. (Previously Amended) The method according to claim 1, wherein said method further comprises: using one or more porous walls (5) that emit a gas towards at least one of the faces (s_1 , s_2) of the treated stream of glass (1a') to guide said treated stream of glass (1a') towards said device or mechanism (7, 8), wherein said guidance is provided while ensuring that at least said central strip of said second face (s_1) of said treated stream of glass (1a') continues to be kept free from contact with any surface.

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Previously Amended) The method according to claim 1, wherein said delivered stream of glass (1a) remains free from any contact with any surface whatsoever over a distance that does not exceed 150 mm.

7. (Previously Amended) The method according to claim 6, wherein said delivered stream of glass (1a) remains free from any contact with any surface with a distance less than 60 mm.

8. (Previously Amended) The method according to claim 1, wherein said treatment of said delivered stream (1a) comprises:

a) receiving said delivered stream of glass (1a) on the surface of a roller (4a), said roller (4a) presenting a suitable surface temperature and being set into rotation in a suitable direction and at a suitable speed to accompany the movement of said stream of glass (1a) without any relative displacement of said stream (1a) relative to the substantially smooth surface of said roller (4a);

b) maintaining contact between the stream of glass (1a) and the roller (4a) without relative displacement over a significant fraction of the circumference of said roller (4a);

wherein said roller (4a) being associated with a device or mechanism (9a) within which there is a cooling fluid for controlling a surface temperature of the substantially smooth surface of said roller (4a) and thus the temperature of the stream of glass (1a) in contact therewith, said roller (4a) being disposed and driven appropriately to ensure that said contact that is maintained cools the stream of glass (1a) sufficiently to obtain the desired increase in viscosity.

9. (Original) The method according to either claim 1 or 8, characterized in that said treated stream (1a') at the end of said treatment presents a viscosity in the range of about 10^3 Pa.s to about 10^6 Pa.s (10^4 poises to 10^7 poises).

10. (Previously Amended) The method according to claim 3, wherein said controlling of said treated stream of glass (1a') is implemented under temperature control.

11. (Cancelled)

12. (Previously Amended) The method according to claim 1, further comprising using margin rollers or wheels (17a, 17b) to guide said treated stream of glass (1a') towards said device or mechanism (7, 8), wherein said guidance is provided while ensuring that at least said central strip of said second face (s_1) of said treated stream of glass (1a') continues to be kept free from contact with any surface.

13. (Previously Amended) The method according to claim 12, wherein pairs of said rollers or wheels (17a, 18a; 17b, 18b) face each other on opposite sides of said treated stream of glass (1a').

14. (Previously Amended) The method according to claim 1, wherein said method further comprises:

a) delivering a second stream of glass (1b; 1c; 1d; 1e) compatible with the first stream of glass (1a); said second stream of glass (1b; 1c; 1d; 1e) having a first and second face (s_1 , s_2), both of said faces being free from contact with any surface, thus possibly being destabilized mechanically;

b) treating said second delivered stream of glass (1b; 1c; 1d; 1e) prior to destabilization in order to stabilize it mechanically and increase its viscosity;

c) guiding the first and second treated streams of glass (1a'; 1b', 1c', 1d', 1e') towards a junction zone; said guidance of said first treated stream (1a') being provided while ensuring that at least the central strip of said second face (s_1) of said first treated stream of glass (1a') that has been kept free from making contact with any surface continues to be kept free from any such contact;

d) joining said first and second treated and guided streams (1a'; 1b', 1c', 1d', 1e'); the streams being joined via the first face (s_2) of said first treated stream of glass (1a') that has come into contact upstream with said treatment device or mechanism (4a), while said second face (s_1) of said first treated stream of glass (1a') remains relatively free from any contact with any surface whatsoever; and wherein an action of said device or mechanism (7, 8) suitable for

controlling the travel speed and the width and the thickness of the sheet of glass is applied to said two joined-together streams of glass (1a'+1b'; 1a'+1c'; 1a'+1d'; 1a'+1e').

15. (Original) The method according to claim 14, wherein said treatment of said second delivered stream of glass (1c) includes rolling or laminating, implemented with or without transferring an imprint.

16. (Previously Amended) The method according to claim 15, wherein the imprint is transferred to face (s1) of the second stream of glass (1b).

17. (Previously Amended) The method according to claim 14, wherein said method comprises:

- delivering two compatible streams of glass (1a, 1b, or 1e); said two delivered streams of glass (1a, 1b, or 1e) each having both faces (s₁, s₂) free from any contact with any surface whatsoever and thus being liable to be destabilized mechanically;

- independently treating said two delivered streams of glass (1a, 1b, or 1e) prior to destabilization, by putting a first face (s₂) in contact with said treatment device or mechanism (4a, 4b) suitable, temporarily, for supporting the weight of said stream of glass (1a, 1b or 1e) and accompanying the falling movement of said stream of glass (1a, 1b or 1e), while increasing the respective viscosities of said stream of glass (1a, 1b or 1e) and maintaining at least the central strip of the second face (s₁) free from contact with any surface whatsoever;

- guiding both of said two treated streams of glass (1a', 1b', or 1e') towards a junction zone; said guidance being provided while ensuring that at least the central strip of the second face (s₁) of each of said two treated streams of glass (1a', 1b', or 1e') is kept free from contact with any surface whatsoever continues to be kept free from any such contact;

- joining together said two treated streams of glass (1a', 1b', or 1e') via their first faces (s₂) that have come into contact with said treatment device or mechanism (4a, 4b) upstream; the second face (s₁) remaining relatively free from any contact with any surface whatsoever;

- acting on said two joined-together treated streams (1a'+1b' or 1e') with device or mechanism (7, 8) suitable for controlling the travel speed, width, and thickness of a resulting sheet of glass; and

- cooling said sheet of glass.

18. (Previously Amended) The method according to claim 17, characterized in that it also comprises:

- transferring an imprint onto the face (s₁) of one (1e') of said two treated streams of glass (1a', 1e') prior to joining together said two treated streams (1a', 1e').

19. (Original) The method according to claim 14, characterized in that it comprises:

- delivering two compatible streams of glass (1a, 1d); said two delivered streams of glass (1a, 1d) each having a first and a second face (s₁, s₂) free from any contact with any surface whatsoever and thus being liable to be destabilized mechanically;

- treating both of said delivered streams (1a, 1d) independently prior to destabilization: a first stream (1a) of said two streams of glass (1a, 1b) being treated by putting a first face (s₂) of its two faces (s₁, s₂) into contact with treatment device or mechanism (4a) suitable for temporarily supporting its weight and for accompanying its falling movement while increasing its viscosity and while maintaining at least the central strip of the second face (s₁) free from contact with any surface whatsoever; while,

the second stream (1d) of said two streams (1a, 1d) is treated by putting a first (s₂) of its two faces (s₁, s₂) into contact with a treatment device or mechanism (4d) suitable, temporarily, for supporting the weight of said glass stream and for accompanying the falling movement of said glass stream, while increasing viscosity of the glass stream and while subjecting the second face (s₁) of its two faces (s₁, s₂) to an action of other device or mechanism (4c) which, co-operating with said treatment device or mechanism (4b), serves to transfer an imprint onto said second face (s₁);

- guiding both of the two treated streams of glass (1a', 1d') towards a junction zone; said guidance being provided while ensuring that at least the central strip of the second face (s₁) of the first treated stream of glass (1a') continues to be kept free from any such contact, and while ensuring that at least the central strip of the second face (s₁) of the second treated stream of glass (1d') onto which an imprint has been transferred is also not put into contact with any surface whatsoever;

- joining said two treated streams of glass (1a', 1d') together via their respective first faces (s₂) which have come into contact with said treatment device or mechanism (4a, 4b) upstream; at least the second face (s₁) of the first treated stream (1a') which does not have an imprint remaining relatively free from any contact with any surface whatsoever;

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- acting on said joined-together treated streams of glass (1a'+1d') by device or mechanism (7, 8) suitable for controlling the travel speed, width, and thickness of said sheet of glass that is produced; and

- cooling said sheet of glass.

20. (Previously Amended) The method according claim 14, wherein said two streams of glass (1a, 1b; 1a, 1c; 1a, 1d; 1a, 1e) are delivered either from a single source (2; 20) or from two distinct sources (200, 200; 200, 2000).

Claims 21-37 (Cancelled)